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2. On Birds collected in Costa Rica.

By ADOLPHE BOUCARD, C.M.Z.S.

[Received Nov. 15, 1877.]

(Plate IV.)

Costa Rica, the most southern of the five Republics known together under the name of "Central America," is said to contain 150,000 inhabitants, of which 100,000 live in the valleys of San José and Cartago. The remainder of the population is widely distributed in small villages, some of them lying at great distances from each other. Thence the difficulty of travelling in the interior of the country.

I arrived at Puntarenas, the Pacific port, on the 29th of December 1876, and remained in the country till the 30th May 1877—in all, five months.

My head quarters were San José, the capital. It is situated in the centre of a very fertile valley, about midway between the Atlantic and the Pacific, at the altitude of 4100 feet. It is said to contain 15,000 inhabitants. My intention was to take a house; but the rent, furniture, and servants were so dear that I stopped all the time at the Hotel Victor, where I was recommended to go.

My hunting-ground during the first weeks was in the valley of San José; but I was rather disappointed, birds being very scarce, which was due chiefly to the poverty of the vegetation, all the soil for many miles having been turned into coffee-plantations. The only places for hunting were the roads from San José to the towns and villages of Heredia, Alajuela, Tres Rios, Desamparados, &c.

On the trees and shrubs surrounding the coffee-plantations small flocks of birds were flying about. These flocks consisted of the following species—*Pyrgisoma cabanisi*, *Zonotrichia pileata*, *Buarremon chrysopogon*, *Saltator grandis*, *Catharus melpomene*, *Turdus grayi*, *Cyclorhis flavipectus*, *Elainea pagana*, *Myiarchus crinitus*, and several other species of Tanagridæ, Fringillidæ, and Tyrannidæ.

Among the Trochilidæ *Pyrrhophæna riefferi*, *Saucerottia sophiæ*, and *Chlorolampis osberti* were the only three species to be seen at that time.

In the gardens and maize-fields several species of *Spermophila* were found feeding on seeds.

In the barrancas (deep ravines occasioned by the large quantity of water which falls in the rainy season) the vegetation was more varied, and several species of Columbidae were met with. In all parts of the valley you always find the same species.

At the end of January, I made an excursion to the valley of San Carlos, in company with MM. Koschny and Meil de Fontenay, who proved to be very good travelling companions. The valley of San Carlos divides the Republic of Costa Rica from that of Nicaragua. It lies on the Atlantic slope, and extends as far as the river San Juan, which is the boundary of the two countries. It is quite a tropical climate, and considered very unhealthy. The forests are of the most magnificent description. There are scarcely any roads or inhabitants, except four or five settlers who are trying to raise cattle, and some few Nicaraguans who are engaged in extracting the juice of the india-rubber tree (*Siphonia elastica*).

To reach San Carlos we had to pass Sarzero and Laguna, two small villages lying at the summit of the Cordillera, near the volcano of Poas. Thence we had to descend gradually about 5000 feet through a very picturesque country.

We arrived the third day, at twelve, at the rancho where we intended to stop. From this rancho you can reach Greytown by water in little more than half a day. The return takes about six days, as you have then to go against the current.

The animal life is prodigious; flocks of birds are constantly passing to and fro. Early in the morning and at sunset large quantities of Howling Monkeys (*Mycetes palliatus*) are heard all around. They make a fearful noise; and one who has not heard them before may well fancy that the forest is thronged with Jaguars. These last-mentioned animals used to be very common; but now they are rather scarce, having been much persecuted.

Large flocks of *Ara macao*, *Chrysotis farinosa*, *Pionus senilis*, *Conurus astec*, and other species of Parrots are constantly passing in all directions.

This excursion lasted a fortnight. During that time I made a good collection of bird-skins, amongst them a female of the rare Cotingine bird, *Carpodectes nitidus*, quite new to science; also many other good species, as *Myrmotherula melæna*, *Urospatha martii*, *Prionirhynchus carinatus*, *Crypturus boucardi*, &c.

All the time I had to work at a great disadvantage. On the trunk of a tree I prepared my skins, with an empty box for a seat. Pigs and ants were always ready to do mischief; and I lost several good specimens of birds by pigs devouring them when they were drying in the sun.

My other excursions were to Cartago, Aguas Calientes, Navarro, Orozi, the Volcano of Irazu, Candelaria, Naranjo, &c.

Cartago is a town of about 10,000 inhabitants. It was formerly the capital; but owing to the frequent earthquakes felt there, and the great destruction of property occasioned by the same, the government was transferred to San José. The town is built at the base of the Volcano of Irazu, in a beautiful valley which varies from three to six miles in width and is about ten in length.

Aguas Calientes is a very prosperous village, only two miles and a half from Cartago. Although at such a short distance, it is much warmer, being well sheltered from the north wind, and about 250 feet lower.

A few miles further, going north-east, are the small villages of Navarro and Orozi, the localities for *Phainoptila melanozantha*, *Chlorophonia callophrys*, *Geotrygon costaricensis*, *Tetragonops frantzii*, &c.; and if you still go further north, you reach Tucuriqui, the locality where Arcé procured the type-specimen (♂) of *Carpodectes nitidus*. All these localities are from 500 to 2500 feet lower than Cartago, and the fauna is very rich.

Naranjo is the name of a very important hacienda, belonging to the Tenoco family. Lately a small village of the same name has been formed by the workmen of the hacienda. It stands on the road from San José to Limon (the Atlantic port).

This locality is very good for a naturalist, lying between the volcanoes of Irazu and Turrialba. In a few hours you can change your altitude from 1500 to 8000 feet or more if you choose; consequently there is a great variety of species to be got. The forests are luxuriant, due chiefly to the climate, which is very wet. It rains nearly all the year round. I found there many of the same species met with at San Carlos.

From Cartago I made several excursions to the Volcano of Irazu.

Up to the altitude of 6000 feet you only see maize- and wheat-plantations, occasionally some potreros (plains) where they fatten cattle, until you reach a small village called Potrero cerrado, where they cultivate potatoes extensively. A little further on begins the forest, where a species of oak tree is very abundant. Then the fauna changes entirely. You do not meet any more with the species of birds found in the valley, but such others as *Ptilogonys caudatus*, *Setophaga aurantiaca* and *S. torquata*, *Parula gutturalis*, *Pezopetes capitalis*, &c. Further on, at the altitude of from 7000 to 8000 feet

the forest is more dense, and the animal life is very abundant. This is the chief locality for *Pharomacrus costaricensis*, *Panterpe insignis*, *Dorycha bryantæ*, and *Turdus nigrescens*.

At the altitude of 8000 feet the forest ceases altogether, and you walk on scorix and ashes sent from the volcano of Irazu a long time ago. Many small trees and aromatic plants grow in the soil up to the summit of the mountain.

This is the locality for *Selasphorus flammula* and *S. scintilla*, which are seen sucking the flowers of mistletoes and heaths. Here also I met with my new species *Zonotrichia vulcani*. I reached the summit of the volcano, and slept there. On the other side, looking north-west, is the crater, which I have thoroughly explored.

Rancho redondo is a farm situated on the western slope of the Volcano of Irazu. It is also a good locality for *Phainoptila melano-xantha*, *Eugenes spectabilis*, *Chasmorhynchus tricarunculatus*, and other rare species.

Atenas is about thirty miles west from San José, on the road to Puntarenas.

San Mateo is on the Pacific slope, at the foot of the Aguacate mountain (rich in gold-mines), about thirty-eight miles from the port. The climate is quite tropical. Some of the species found at San Carlos are also met with here. It is also a rich locality for reptiles and insects.

Barranca is only about half a mile from the sea, and ten miles from Puntarenas. The village is built near the river of the same name.

Puntarenas is the port. Its name is very appropriate, as it stands on a sandy peninsula extending for about six miles. On one side is the sea, on the other a river; sometimes the width of this isthmus between the river and the sea is only fifty yards, and never more than one mile. It is excessively hot and unhealthy for a new comer. The vegetation is poor; but four miles from the town is a fine forest, where animal life is plentiful.

Altogether Costa Rica has been well explored by MM. Warzewicz Frantzius, Hoffmann, Ellendorf, Carmiol, father and son, Endrés, Arcé, Zeledon, Cooper, and others.

Up to this day 520 species of birds (some doubtful) are recorded as having been collected in that country; and I feel well satisfied when I think that in a country so well worked up I have been able to obtain several new species and some great rarities—such as both sexes of *Phainoptila melano-xantha*, a new genus and new species just described by Mr. Osbert Salvin, *Carpodectes nitidus* (♀), *Catharus frantzii*, *Catharus gracilirostris*, *Turdus nigrescens*, *Turdus obsoletus*, *Parula gutturalis*, *Pezopetes capitalis*, *Melozona leucotis*, *Eugenes spectabilis*, *Selasphorus scintilla*, *Selasphorus flammula*, *Oreopyra hemileuca*, *Oreopyra cinereicauda*, *Panterpe insignis*, *Conurus hoffmanni*, *Geotrygon costaricensis*, *Dendrortyx leucophrys*, *Crypturus boucardi*, &c. &c.

The total number of species which I collected is about 250; but I worked very hard to obtain this result, and until the time of my

departure I did not lose a single day, and often I had no repose from morning till night. I could easily have obtained a larger number of specimens; but I did not collect very well-known and common birds which were already well represented in my collection.

I consider Costa Rica one of the worst places for making collections, in consequence of the difficulty of transport, the bad roads, and the great expense which these deficiencies occasion. You must carry every thing with you, live and sleep as you can and where you can, sometimes in the most miserable huts, sometimes in the forest.

At first I was not able to find help at any price. A few hunters, willing to work for me at high pay, made such bad skins that I was obliged to dismiss them.

Others to whom I offered good prices for birds in the flesh never came again after I gave them powder and shot. At last, a little before my departure, I met with two good hunters, whom I employed a few days, and did very well with them; but it was rather too late, the time of my departure having arrived, and the best season for birds being over.

The classification which I have followed in the following list is that of my 'Catalogus Avium.'

Ordo CRYPTURI.

Family TINAMIDÆ.

1. NOTHOCERCUS BONAPARTII, Gray.

Tinamus frantzii, Lawr.

Native name "Gallina del monte." Only one specimen procured, in May 1877, at Rio Navarro, at the base of the Candelaria Mountains, twelve miles from San José.

This seems to be a rare species; the typical specimen of *T. frantzii*, Lawr., was collected at Cervantes by J. Zeledon. Cervantes is not far from Rio Navarro.

Like all Tinamidæ, it is found in the dense parts of the forest, where it feeds on insects and seeds. They can be easily detected by the noise they make when scratching the ground in search of food. They go in pairs, repeatedly calling one another. When fearing danger they run with much rapidity.

2. CRYPTURUS BOUCARDI, Scl.

The type of this species was from Mexico, and not from Guatemala as stated in Gray's 'Hand-list of Birds.' As well as I can remember, the first specimen (the type of this species) was obtained by me at Playa Vicente, a small village up the river Papaloapam, the mouth of which is at Alvarado, on the Atlantic, between Vera Cruz and Minatitlan.

As far as I know, all specimens of this bird have been obtained in the tropical forests a few hundred feet above the sea-level; but it is an interesting fact that this species has been obtained also in Guatemala and Costa Rica.

Only one specimen (♀) collected, at San Carlos, where it was rather abundant in February. They are rather easy to detect, in consequence of a plaintive cry which they repeat frequently, as if calling one another.

The flesh is white and delicious to eat.

I have also one specimen, obtained at San Carlos, which is much darker than *C. boucardi*. It has not any of the black and yellow spots, either on the back or on the secondaries and tertiaries, which are so conspicuous in the former. Instead of that the secondaries are nearly black, bordered with rufous grey, the tertiaries are rufous grey, the back is rather dark rufous, darker on the rump, the upper tail-coverts are rufous, with an indication of yellow and black spots, as in *C. boucardi*. On the underside the abdomen is nearly of the same grey colour as the breast, slightly rufous on each side.

Ordo GALLINÆ.

Family CRACIDÆ.

3. PENELOPE PURPURASCENS, Wagl.

Native name "Faisan."

Hab. Volcan de Irazu.

Rather common in the forests on the slopes of the volcano. It is also found in San Carlos, showing that it lives indifferently in low or high altitudes.

4. CHAMÆPETES UNICOLOR, Salv.

Hab. Volcan de Irazu.

They are in great demand for food in San José, where they sell at from four to eight shillings.

Subfamily CRACINÆ.

5. CRAX GLOBICERA, L.

Native name "Pavo."

Hab. San Carlos, Volcan de Irazu, Naranjo.

Rather common.

Subfamily ODONTOPHORINÆ.

6. ODONTOPHORUS GUTTATUS, Gould.

Native name "Perdiz."

Hab. Curridabat, near San José.

Two specimens, one male and one female, killed in March.

7. DENDRORTYX LEUCOPHRYS, Gould.

One specimen, from the Volcano of Irazu, May. Killed at the altitude of 7000 feet. It was scratching the ground in search of food.

8. ORTYX LEYLANDI, Moore.

Valley of San José. Common in the coffee-plantations during the

rainy season, from May to December, rare in the other months; then it disappears completely from the valley. They are also met with in small flocks in the plains. They run very fast.

Ordo COLUMBÆ.

Family COLUMBIDÆ.

Subfamily COLUMBINÆ.

9. COLUMBA ALBILINEATA, Gray.

Several specimens from the Volcano of Irazu, May. Is found in flocks of ten or twelve, feeding on seeds. I have seen them coming from all directions to drink at a spring of mineral water near Desamparados.

10. COLUMBA SUBVINACEA, Lawr.

Only one specimen, from Candelaria, May. Very rare.

11. ZENAIDURA CAROLINENSIS, L.

Several specimens, from San José, January to May.

Subfamily GOURINÆ.

12. CHAMÆPELIA PASSERINA, L.

Common near San José, January to May.

13. CHAMÆPELIA RUFIPENNIS, Gray.

Very abundant at Puntarenas in May.

14. LEPTOPTILA VERREAUXI, Bp.

Several specimens from San José, January to March.

15. LEPTOPTILA CASSINI, Lawr.

Only one specimen, from San Carlos, February. Inhabits the forest. I also found two eggs of this species on a small tree. They are uniform white. The male was sitting on the eggs.

16. GEOTRYGON MONTANA.

San Carlos, February.

17. GEOTRYGON COSTARICENSIS, Lawr.

Several specimens killed on the mountain of Candelaria, at the altitude of from 3000 to 4000 feet.

Feeds on seeds, and very likely also on insects. The crop of one of the specimens dissected, and which I have here, is full of small seeds. I have always seen them on the ground, going singly. The sexes are exactly alike.

18. GEOTRYGON CHIRIQUENSIS, Sclat.

Geotrygon cæruleiceps, Lawr.

Native name "Paloma del Monte."

Volcano of Irazu and Candelaria.

This is a scarce species in Costa Rica. Like the former, it has the

same habits as the Tinamidæ and Odontophorinæ of going about on the ground. I have never seen it perched.

Ordo LIMICOLÆ.

Family CHARADRIIDÆ.

19. OXYECHUS VOCIFERUS, L.

Valley of San José.

Excessively common in the plains, where they are seen constantly running about searching for food, and even catching grasshoppers and small insects on the wing. When surprised they run very fast, at the same time crying, as if to advise one another of some danger.

Family SCOLOPACIDÆ.

20. TRINGOIDES MACULARIUS, L.

Several specimens shot in the valley of San José. They are found along the streams, flying from one stone to another, or searching for food close to the water. When surprised they take to flight, emitting a sharp cry, similar to *pit, pit, pit*.

Ordo HERODIONES.

Family PLATALEIDÆ.

21. PLATALEA AJAJA, L.

One specimen near San José, April.

Ordo ANSERES.

Subfamily ANATINÆ.

22. DENDROCYGNA AUTUMNALIS, L.

Native name "Pato."

Common at the laguna of Cartago, where the division of the waters takes place, either for the Atlantic or the Pacific.

Ordo ACCIPITRES.

Family FALCONIDÆ.

23. MICRASTUR SEMITORQUATUS, Vieill.

One specimen, killed in the forests of Candelaria Mountains, May.

24. BUTEO LATISSIMUS, Wils.

Buteo pennsylvanicus, Wils.

One specimen, killed at San José in January.

25. URUBITINGA GHIESBREGHTI, Du Bus.

One specimen, from Naranjo, April. Rare.

26. THRASAËTUS HARPYIA, L.

Native name "Aguila."

I have seen one specimen alive in San José. It was caught in the

Candelaria Mountains. It was kept in a large cage, and seems quite at home. When you approach it, it erects its crest, and presents then a very imposing sight.

27. *ELANOIDES FURCATUS*, L.

One specimen from Naranjo. I saw several in a place cleared for sowing. They sat motionless for hours at the top of the highest trees, probably watching for their prey.

28. *LEPTODON UNGINATUS*, Temm.

Native name "Gavilan."

One specimen, from Naranjo, April. This bird has a strong cry, which sounds like *oua, oua, oua*, repeated several times in succession. It resembles very much the cry of the Peacock when asking for rain (as vulgarly said). It is so loud that you can hear it at a long distance. The capture of my specimen was due to it. It was perched on the top of a high tree in the forest; and if it had not been for its cry, I do not think I should have detected it. Several of these birds were at about half a mile one from the other, and crying in succession; and it occurs to me that each one takes possession of a certain part of the forest and admits of no intruder.

29. *CERCHNEIS SPARVERIUS*, L.

Common in all altitudes, January to May.

Family VULTURIDÆ.

30. *CATHARTES PAPA*, L.

Native name "Rey de los Zopilotes."

Seen at San Mateo in May.

31. *CATHARISTES ATRATUS*, Barth.

Native name "Zopilote."

Common everywhere all the year round.

32. *ŒNOPS AURA*, L.

Native name "Zopilote de cabeza colorada."

San José, January to May.

Ordo STRIGES.

Family BUBONIDÆ.

33. *SCOPS BRASILIANUS*, Gm.

Native name "Lechuza."

One specimen from San José. It was perched on a small tree in company with two adult specimens. I killed the young and the female with the same shot.

34. *LOPHOSTRIX STRICKLANDI*, Sclat. & Salv.

San Carlos, February.

Ordo PSITTACI.

Subfamily ARAINÆ.

35. *ARA MACAO*, L.

Native name "Guacamaya."

Common at San Carlos. Every morning they fly about in large flocks. In the daytime you can see them in the forest eating fruit ; they are easily detected by the noise they make, and by the rejected pieces of fruit constantly falling down from the trees on which they are perched.

36. *ARA MILITARIS*, L.

San Carlos, Sarzero, February.

37. *CONURUS HOFFMANNI*, Cab.

Native name "Perico."

Several specimens killed at the foot of the Candelaria Mountains. I have also seen small flocks at Aguas Calientes, near Cartago. When flying they appear excessively beautiful: this is due principally to the conspicuous colour of their wings.

38. *CONURUS ASTEC*, Souancé.

Native name "Perico."

One specimen killed at San Carlos, amongst a large flock eating fruit and seeds in the forest, February.

39. *BROTOGERYS TOVI*, Gm.

Native name "Periquito."

Common at San Carlos, February.

40. *PIONUS SENILIS*, Spix.

Native name "Cotora."

Common at San Carlos in February. Found in company with *Conurus astec*.

41. *CHRYBOTIS FARINOSA*, Bodd.

Chrysotis pulverulenta, Gm.

Native name "Loro."

Common at San Carlos in February.

Ordo COCCYGES.

Subordo ZYGODACTYLÆ.

Family RAMPHASTIDÆ.

42. *RAMPHASTOS TOCARD*.

Native name "Pico de canoa."

Common at San Carlos in February.

43. *PTEROGLOSSUS TORQUATUS*, Gm.

Common at San Carlos in February.

44. *PTEROGLOSSUS FRANTZII*, Cab.

Common at San Carlos in February.

45. *SELENIDERA SPECTABILIS*, Cass.

Naranjo, April.

46. *AULACORAMPHUS CÆRULEOGULARIS*, Gould.

Naranjo, April.

All these species are found in the forests in small flocks of from ten to fifteen. They live chiefly on fruit.

Family *CAPITONIDÆ*.Subfamily *CAPITONINÆ*.47. *TETRAGONOPS FRANTZII*, Sclat.

Several specimens from Navarro, May. Found in the forests near the streams.

48. *CAPITO BOURCIERI*, Lafr.

Two specimens, from Orozi and Navarro.

Family *BUCCONIDÆ*.49. *MALACOPTILA PANAMENSIS*, Lafr.

Two specimens, male and female, killed at San Carlos in February. Always seen in the forests.

Family *GALBULIDÆ*.50. *GALBULA MELANOGENIA*, Sclat.

Common at San Carlos in February.

Family *CUCULIDÆ*.Subfamily *CROTOPHAGINÆ*.51. *CROTOPHAGA SULCIROSTRIS*, Sw.

Very common in the valley of San José on the edges of the coffee-plantations. They go in flocks of from ten to fifteen, flying from one bush to another. They do not notice the presence of man, and are commonly called "Garapatero" (eater of Garapatas, a common parasite which lives principally on cattle, and also on men). They are often seen on the back of animals, eating the insects which infest them. The cattle seem to enjoy very much the close company of this auxiliary, which does such good service for them. I have one egg of this species, which is of the size of a Pigeon's, all white.

Subfamily *COCCYZINÆ*.52. *COCCYZUS MINOR*, Gm.

One specimen, from Puntarenas, May. This is the first time that this species is recorded from Costa Rica.

53. *PIAYA MEHLERI*, Bp.

Several specimens from San José. It is called commonly "Bobo de pecho aplomado." The expression "Bobo" means imbecile, because it is very tame, and you can shoot it very easily. I have always seen them on the edges of the coffee-plantations.

54. *MOROCOCCYX ERYTHROPYGUS*, Less.

One specimen, from Atenas, May. It was on the side of the road, where I observed it for several minutes before I killed it. It jumped from one stone to another, then came down and scratched the ground for insects, then perched on a low branch, and so on, without taking any notice of me, although I was only a few yards distant.

Subordo *HETERODACTYLÆ*.Family *TROGONIDÆ*.55. *PHAROMACRUS MOCINNO*, Llave, var. *costaricensis*, Gould.

Native name "Quetzal."

A large number of specimens, from the Volcano of Irazu, Navarro, Candelaria, Naranjo, in fact from all the mountains around San José and Cartago. Very difficult to get. It is only by imitating the cry of the female that the men of the country can get a shot at the males. They keep in the denser parts of the forest, chiefly in the places called "barrancas" (deep ravines, very difficult of access). They feed on seeds and fruit. In May (the season of acorns) they are found in small flocks of ten to twelve on the robbable trees, and can then be easily killed. During the breeding-season they go in pairs, male and female, constantly calling one another.

For further details on the habits of this bird, see part xi. of 'Ornithological Miscellany'.

56. *TROGON MASSENA*, Gould.

San Carlos, February. I have always seen these birds in the forests. They perch high, and remain a long time stationary.

57. *TROGON PUELLA*, Gould.

Several specimens killed at Navarro and in the Candelaria Mountains in May.

Subordo *ANISODACTYLÆ*.Subfamily *ALCEDININÆ*.58. *CERYLE CABANISI*, Tsch.

Native name "Martin pescador."

Common everywhere, January to May.

Family *MOMOTIDÆ*.59. *MOMOTUS LESSONI*, Less.

Four specimens, from San José, January, March. It is vulgarly

¹ I have sent a full account of my observations on this species to Mr. G. D. Rowley, which he has published in his interesting work.

called "Bobo," because it is quite tame and easy to kill. I saw these birds chiefly in the coffee-plantations near the streams. Its cry has rather a hollow sound, sometimes like the word "mou mot," or "mot mot," from which the name of the genus is derived.

60. *UROSPATHA MARTII*, Spix.

Several specimens from San Carlos, killed in February. Always seen in the forest, where they make a fearful noise calling one another. Its note has some resemblance to the cry of the former species, but is much stronger and more hollow. They are easily killed at first, but they are wilder after a few shots. I have met with them in small flocks.

61. *PRIONIRHYNCHUS CARINATUS*, Du Bus.

One specimen, a female, collected at San Carlos, February. Rare. Goes by pairs in the forest. This is the first time that this species has been found so far south.

62. *EUMOMOTA SUPERCILIARIS*, Sw.

One specimen, from Barranca, near Puntarenas, May. Like *Momotus lessoni* and other Momotidæ, it will remain for a long time perched on the same branch, and the only sign of its being alive is the frequent movement of its tail.

Ordo PICI.

Family PICIDÆ.

63. *DYCTIOPICUS JARDINEI*, Malh.

Native name "Carpintero."

Two specimens from the Volcano of Irazu and from Navarro, January and May 1877.

64. *CENTURUS HOFFMANNI*, Cab.

Two specimens, from San José, January, and Cartago, April; killed in the coffee-plantations. Also one specimen from Puntarenas which I cannot possibly separate from this species, although it is a much smaller bird.

65. *CENTURUS PUCHERANI*, Malh.

Two specimens, one from San Carlos, February, the other from Naranjo, April.

66. *MELANERPES FORMICIVORUS*, Sw.

Several specimens from the Volcano of Irazu, May 1877. I have seen some also at Naranjo.

Ordo PASSERES.

Subordo OSCINES.

OSCINES DENTIROSTRES.

Family TURDIDÆ.

67. *TURDUS GRAYI*, Bp.

Native name "Giguira."

Several specimens from San José, where they are found in large quantities during the fruit-season. They are particularly fond of a small fruit called in the country "cereza." My specimens differ widely from the ordinary form of *T. grayi* in their general coloration: instead of being rufous, they are ashy grey with a rufous reflection, but so different in coloration that it is impossible to mistake one for the other; the sides of the abdomen are of the same colour as the underside plumage, whereas in *T. grayi* they are rufous, nearly red.

I have two eggs of this bird, found in one nest built in the centre of an aloe growing on the road. They are green, with rufous spots.

68. *TURDUS PLEBEIUS*, Cab.

One specimen, from Navarro, April.

69. *TURDUS NIGRESCENS*, Cab.

Several specimens from the Volcano of Irazu.

I never saw this species anywhere else. They are found in small flocks in the oak-tree region, at the altitude of from 6000 to 10000 feet. I found a nest containing two eggs. They are of a pale uniform green.

70. *TURDUS LEUCAUCHEN*.

Only one specimen, from Orozi, May.

71. *TURDUS OBSOLETUS*, Lawr.

Only one, female specimen, from Naranjo, April. This species seems to be rare. It lives in the forest.

72. *CATHARUS MELPOMENE*, Cab.

Native name "Paxaro ingles" (English bird); I could not learn why.

Many specimens, from San José and Cartago, where they are found on the edges of the coffee-plantations. They are often seen on the ground searching for insects. They sing beautifully.

73. *CATHARUS FRANTZII*, Cab.

Two specimens from Navarro, May. Very rare.

74. *CATHARUS GRACILIROSTRIS*, Salv.

Two specimens from the Volcano of Irazu, April. Very rare.

Family SYLVIIDÆ.

75. MYIADESTES MELANOPS, Salv.

Several specimens, from Navarro, May 1877. Always found in the forest, where they are easily detected in consequence of their beautiful and clear song. It is short; but nothing could be more perfect in tone. Occasionally they are brought alive for sale to San José; but they are not easily domesticated.

Family TROGLODYTIDÆ.

76. TROGLODYTES INTERMEDIUS, Cab.

Troglodytes hypaëdon, Sclat.

Many specimens, from San José, Cartago, and Naranjo. It is vulgarly called "Salta pared," which means "jump-the-wall." They are common in the gardens from January to May.

77. THRYOPHILUS MODESTUS, Cab.

Many specimens, from San José, Cartago, and San Mateo. I have always found them on the edges of the coffee-plantations. January to May.

78. THRYOPHILUS CASTANEUS, Lawr.

Several specimens, from San Carlos; killed in February. Found in the forests near the habitations.

79. THRYOPHILUS PLEUROSTICTUS, Sclat.

Two specimens, from Puntarenas, May. Killed in the forest close to the sea.

80. THRYOPHILUS THORACICUS, Salv.

One single specimen, from San Carlos, February. Rare.

81. CAMPYLORHYNCHUS ZONATUS, Less.

Only one specimen, killed at San Mateo in May. They go in small flocks, making a great noise as they fly from one tree to another in the open spaces in the forest.

82. HENICORHINA LEUCOSTICTA, Cab.

Several specimens, from San Carlos and Orozi. Always found in the forest on the ground.

83. HENICORHINA LEUCOPHRYS, Tsch.

Only one specimen, from Navarro, May.

Family MNIOTILTIDÆ.

84. SIURUS NOVEBORACENSIS, Gm.

One specimen, from San José, March.

85. SIURUS AUROCAPILLUS, L.

Two specimens, from San José, January and March.

86. *MNIOTILTA VARIA*, L.

San Carlos, February.

87. *PARULA GUTTURALIS*, Cab.

Several specimens, from the Volcano of Irazu, April and May.
Killed on the oak trees at an altitude of 6000 feet.

88. *HELMINTHOPHAGA PEREGRINA*, Wils.

Several specimens, from San José, January, March.

89. *DENDRÆCA BLACKBURNIÆ*, Gm.

One specimen, from Naranjo, April.

90. *DENDRÆCA PENSYLVANICA*, L.

San Carlos, February.

91. *DENDRÆCA ÆSTIVA*, Gm.

Several specimens, from San José, January, March.

92. *DENDRÆCA VIEILLOTI*, Cassin.

One single specimen, from Puntarenas, killed in May on the mangrove trees, in close proximity to the river.

93. *GEOTHLYPIS TRICHAS*, L.

Several specimens, from San José and Cartago, January to May.

94. *GEOTHLYPIS POLIOCEPHALA*, Baird, var. *caninucha*, Ridgw.

Only two specimens, from San José, killed in January and February.

95. *MYODIOCTES PUSILLUS*, Wils.

Several specimens, killed at San José in January.

96. *BASILEUTERUS MESOCHRYsus*, Sclat.

Many specimens, from San José and Cartago, January to May.

97. *BASILEUTERUS CULICIVORUS*, Licht.

San José, January to May.

98. *BASILEUTERUS UROPYGIALIS*, Sclat.

Only one specimen, from San Carlos, killed in February. It is a very rare species, living along the streams in the forest. It never rests, but is constantly going up or down the river from one place to another, sitting on stones or scratching the ground. I saw several specimens in the same place, but could only get one, as it is a very wild bird.

99. *SETOPHAGA RUTICILLA*, L.

Several specimens, from San José and Cartago, January and April.

100. *SETOPHAGA AURANTIACA*, Baird.

Several specimens from Cartago and Naranjo. This species inhabits the forests; in the middle of the day they go along the streams, flying from one tree to another, feeding on insects. I have always seen them going in pairs.

101. *SETOPHAGA TORQUATA*, Baird.

Several specimens of this rare species, all of them killed in the forest on the Volcano of Irazu. Always seen in pairs. The female differs very little from the male.

Family VIREONIDÆ.

102. *VIREOSYLVA FLAVOVIRIDIS*, Cass.

One specimen, from San José, April.

103. *VIREOSYLVA OLIVACEA*, Linn.

San José, January to May.

104. *VIREOSYLVA PHILADELPHICA*, Cass.

Several specimens, from San José, January.

105. *VIREOSYLVA FLAVIFRONS*, Vieill.

Several specimens, from San José, January, March.

106. *VIREOSYLVA JOSEPHÆ*, Sclat.

Only one specimen, from Naranjo, April.

107. *HYLOPHILUS DECURTATUS*, Bp.

One specimen, from San José, May.

108. *CYCLORHIS FLAVIPECTUS*, Sclat.

Cyclorhis subflavescens, Cab.

Several specimens, from San José, February, March, and April.

Family AMPELIDÆ.

109. *PTILOGONYS CAUDATUS*, Cab.

Several specimens, killed in the forest of oak trees on the Volcano of Irazu; also some specimens from Navarro, May.

110. *PHAINOPTILA MELANOXANTHA*, Salv.

Several specimens of both sexes, from Navarro and Rancho Redondo, January to May. Found in pairs along the streams—not in the region of the oak trees, as suggested by Mr. G. Dawson Rowley, but much lower down, at an altitude of about 4000 feet, and in semitropical forests. The two sexes of this rare species have been beautifully figured, from specimens obtained by me, in the 'Ornithological Miscellany,' part x.

OSCINES TENUIROSTRES.

Family CÆREBIDÆ.

111. DIGLOSSA PLUMBEA, Cab.

Several specimens, from Cartago, Navarro, Naranjo, Volcano of Irazu, and La Laguna; all of them killed at the altitude of from 4000 to 8000 feet.

112. DACNIS VENUSTA, Lawr.

Several specimens, from Candelaria, May.

113. CHLOROPHANES SPIZA, var. *guatemalensis*, Sclat.

One specimen, from Naranjo, April.

OSCINES CONIROSTRES.

Family TANAGRIDÆ.

114. CHLOROPHONIA CALLOPHRYS, Cab.

Several specimens of this fine species, from Navarro and Candelaria, May.

115. EUPHONIA ELEGANTISSIMA, Bp.

Several specimens, from San José. Found on the road feeding on the fruit of the mistletoe. These birds sing beautifully, and are easily domesticated.

116. EUPHONIA CRASSIROSTRIS, Sclat.

Only one specimen, from Cartago, April.

117. EUPHONIA GOULDI, Sclat.

Two specimens, male and female, from San Carlos, February.

118. CALLISTE ICTEROCEPHALA, Bp.

Calliste frantzii, Cab.

Two specimens, from Naranjo and Orozi, June, May. Rather abundant on the edges of the forests where clearings have been opened.

119. CALLISTE GYROLOIDES, Lafr.

Navarro, May.

120. CALLISTE LARVATA, Du Bus.

Calliste franciscæ, Lafr.

Several specimens, from Naranjo, Orozi, and San Carlos.

121. CALLISTE DOWII, Salv.

Several specimens, from Navarro, May. Rare.

122. TANAGRA CANA, Sw.

Tanagra diaconus, Less.

Several specimens, from San José, January. Rather common on the trees bordering the coffee-plantations.

123. *TANAGRA PALMARUM*, Max.*Tanagra melanoptera*, Hartl.

Common at Naranjo, April; San José, March to May.

124. *RAMPHOCELUS PASSERINII*, Bp.

San Carlos, February; Naranjo, April. Found commonly in the "rastrojos" (abandoned plantations near the habitations). Always seen in pairs; but several pairs are often met with near one another in the same locality.

125. *PHLOGOTHRAUPIS SANGUINOLENTA*, Less.

Orozi, May. I have seen them in pairs, like the above species; but sometimes five or six may be seen eating fruits or seeds on the same tree.

126. *PYRANGA RUBRA*, L.

San José, April.

127. *PYRANGA ERYTHROMELÆNA*, Licht.

Naranjo, April; Candelaria, May. In the forest.

128. *PYRANGA BIDENTATA*, Sw.

Several specimens, from the forests of Navarro and Volcano of Irazu, May.

129. *PHÆNICOTHRAUPIS FUSCICAUDA*, Cab.

Two specimens, male and female, from San Carlos, February. Found in the forest, perching on branches near the ground. Feeds on insects.

130. *TACHYPHONUS LUCTUOSUS*, Lafr. & D'Orb.

San Carlos, February. Feeding on insects in the forest.

131. *TACHYPHONUS DELATTRII*, Lafr.

San Mateo, May. I have always found these birds in company with the above species, and many others, where large quantities of migratory ants were travelling. They went in the same direction as the ants; and now and then I saw them hopping to the ground, and perching on low branches. Doubtless they were feeding on these ants.

132. *CHLOROSPINGUS ALBITEMPORALIS*, Lafr.

Several specimens collected at La Laguna, Naranjo, and Navarro, February, April, and May. This species seems to be widely distributed. I have seen them in the forest, chiefly at places where openings had been made for sowing-purposes.

133. *BUARREMON CAPITALIS*, Cab.*Pezopetes capitalis*, Cab.

Several specimens from the Volcano of Irazu, April and May. The two sexes are exactly alike. They go in pairs; but several pairs

may be seen at a short distance from one another. They perch on the lower branches in the forest, but are most of their time busy scratching the ground in search of insects. They make such a noise in doing so, that at first I thought they were *Odontophori* or *Tinami*. The sexes are constantly calling each other; and as soon as you see one appearing, the other follows shortly after. They run fast. I have never seen this bird anywhere else.

134. BUARREMON BRUNNEINUCHUS, Lafr.

Several specimens from Cartago, Navarro, and Rancho Redondo, April, May. Rather a rare species in Costa Rica; all my specimens were obtained on the edges of abandoned plantations at the altitude of 4500 feet.

135. BUARREMON CHRYSOPOGON, Bp.

Many specimens, from San José and Cartago.

136. BUARREMON TIBIALIS, Lawr.

Several specimens, from Navarro and the Volcano of Irazu, May. Rather scarce; found in the forest, principally along the streams.

137. ARREMON AURANTIROSTRIS, Lafr.

Arremon rufidorsalis, Cass.

One specimen, from San Carlos, February.

138. SALTATOR MAGNOIDES, Lafr.

Several specimens, from San José and Cartago. Common in March and April.

139. SALTATOR GRANDIS, Lafr.

Several specimens, from San José. Common in March, April, and May.

Family FRINGILLIDÆ.

140. CHRYSOMITRIS BRYANTII, Cass.

One male specimen, from the Volcano of Irazu, May. Rare.

Subfamily PASSERELLINÆ.

141. EMBERNAGRA STRIATICEPS, Lafr.

One specimen, from San Carlos, February. Killed close to the rancho. I have also seen this species at Puntarenas.

142. PYRGISOMA CABANISI, Sclat. & Salv.

Many specimens, from San José and Cartago, January to May. Killed on a sort of hawthorn edging the coffee-plantations.

143. PYRGISOMA LEUCOTE, Cab.

Melozona leucotis, Cab.

Several specimens, from San José, February, and Cartago, April. Very rare.

144. ZONOTRICHIA VULCANI, sp. n. (Plate IV.)

Supra cinereo-olivacea, pileo, dorso alis et cauda pallide nigris, plumarum marginibus olivascentibus, secundariorum dorso proximorum marginibus externis rufis; subtus plumbescenti-cinerea unicolor, rostro et pedibus pallide flavis.

Forehead olivaceous grey, with the central extremity of each feather nearly black; back and wing-coverts of the same colour, but the black is darker and very conspicuous in each feather; tail-coverts olivaceous; upper surface of the tail almost black, with olivaceous fringes; underside uniform plumbeous grey, slightly darker on the breast and sides of the abdomen; under tail-coverts olivaceous grey; underside of the wings and tail about the same grey as the abdomen, with silky reflections; primaries and tertiaries black, with olivaceous fringes; secondaries with the fringes wider and rufous in the upper part; the upper mandible of the beak nearly red, then black, with white tip; under mandible fleshy yellow; toes of the same colour. Full length $6\frac{7}{8}$ inches, wing $3\frac{1}{8}$, tail 3.

There is no difference whatever between the male and female, except that the latter is a trifle smaller.

The young is very much like young of *Junco*, *Peucea* or *Melospiza*; the upperside and underside are olivaceous grey, with the centre of each feather black; the fringes of the upper wing-coverts are wider than in the adult specimens and more rufous.

Several specimens, from the Volcano of Irazu, obtained at the altitude of 10,000 feet.

145. ZONOTRICHIA PILEATA, Bodd.

Many specimens, from San José, Cartago, Sarzero, and Volcano of Irazu. Vulgarly called "Come-maiz" (Eat-maize), because they are very injurious to the maize-plantation crops. It is met everywhere, even in the gardens, and takes the place in America of the *Passer domesticus* in Europe. I have seen them at nearly all altitudes. The eggs of this bird are green, with rufous spots all over at the broader end.

Subfamily CYANOSPIZINÆ.

146. VOLATINIA JACARINA, L.

San José, March.

147. CYANOSPIZA CIRIS, L.

One specimen from Tres Rios, January. Obtained in a curious way. Having shot what I thought to be *Cyanospiza cyanea*, I could not find my bird where I thought I saw it fall, but during my search I found this specimen of *Cyanospiza ciris*, quite dead. It was so thin that it had evidently died from cold and hunger; and I attribute to this fact the body not being decomposed, as I have no doubt that it had been dead for some time. I took great care in skinning the bird; and I had the satisfaction to make a fine skin of it, which is now exhibited.

148. *CYANOSPIZA CYANEA*, L.

San José, March.

149. *PHONIPARA PUSILLA*, Sw.

Several specimens, from San José, January and February. Found in the rastrojos.

Subfamily SPERMOPHILINÆ.

150. *HEDYMELES LUDOVICIANA*, L.

One specimen, from San José, January.

151. *PHEUCTICUS TIBIALIS*, Baird.

Several specimens, from Navarro and the Volcano of Irazu, May.

152. *SPERMOPHILA MORELETI*, Pucher.

Several specimens, from San José, March and April. Very common in the maize-plantations in the time of the harvest.

153. *SPERMOPHILA CORVINA*, Sclat.

Two specimens, male and female, from San Carlos, February.

154. *SPERMOPHILA AURITA*, Bp.

Spermophila semicollaris, Lawr.

One specimen, male, from San Mateo.

Subfamily EMBERIZINÆ.

155. *EUSPIZA AMERICANA*, Gm.

Several specimens, from San José and Potrero cerrado (Volcano of Irazu). Excessively common in March, flying about on the roads in large flocks. It is then very fat, and delicious eating.

OSCINES CULTRIROSTRES.

Family ICTERIDÆ.

156. *OCYALUS WAGLERI*, Gray and Mitch.

Orozi, May. I have also seen many specimens at San Carlos and Naranjo.

157. *OSTINOPS MONTEZUMÆ*, Less.

Very common at San Carlos and Naranjo, February. The sight of their nests hanging close together at the extremity of the branches on the trees is very peculiar. They select the highest trees left where the forest has been cleared; so that they cannot escape detection. I have seen as many as thirty nests in one single tree. They make a fearful noise when they come and go out of their nests.

158. *CASSICUS PREVOSTI*, Less.

One specimen, from San José, March. Killed on the bushes forming the edges of coffee-plantations. I have seen many other specimens.

159. *ICTERUS BALTIMORE*, L.

Several specimens, from San José, March and April. Called vulgarly "Cacique de Naranjo" (Cacicus of orange-trees); because they are very fond of this fruit.

160. *ICTERUS PROSTHEMELAS*, Strickl.

One specimen, from Naranjo, April.

161. *MOLOTHRUS ÆNEUS*, Wagl.

Very common at San José, February to May. They go about in large flocks, and are often seen in the gardens of the town, as well as on the pavement in the streets.

162. *STURNELLA LUDOVICIANA*, L.

Very common in the "potreros" (plains), principally at Cartago, April and May.

Family CORVIDÆ.

163. *PSILORHINUS MORIO*, Licht.

Several specimens, from San José. Very common in the coffee-plantations. Called vulgarly "Pepe;" because their cry is an imitation of that Spanish word, in English "papa." As soon as they perceive any body, man or beast, moving about they fly, making a fearful noise with their cries of pa, pa, pa. You can depend upon it that when you hear these birds crying some one is near at hand.

Subordo TRACHEOPHONÆ.

Family DENDROCOLAPTIDÆ.

164. *SYNALLAXIS ERYTHROPS*, Sclat.

Two specimens, from the Volcano of Irazu, March, and Navarro, May. In the forest.

165. *SYNALLAXIS PUDICA*, Sclat.

Synallaxis nigrifumosa, Lawr.

One specimen, from Naranjo, April; killed on the edge of the sugar plantations.

166. *PSEUDOCOLAPTES BOISSONEAUTI*, Lafr. (?).

One specimen from Navarro, May. It differs from the other specimens which I have of *P. boissoneauti* in the sides of the throat being yellow instead of pure white; however, for the present, I do not consider this difference sufficient to make another species of it.

Subfamily PHILYDORINÆ.

167. *PHILYDOR RUFO-BRUNNEUS*, Lawr.

One specimen, from Navarro, May.

168. *ANABAZENOPS VARIEGATICEPS*, Sclat.

Several specimens, from Candelaria, April, May.

Subfamily DENDROCOLAPTINÆ.

169. MARGARORNIS RUBIGINOSA, Lawr.

Two specimens, from Navarro, May.

170. GLYPHORHYNCHUS CUNEATUS, Licht.

One specimen, from Naranjo, April. Killed in the forest on the trunk of a tree. This bird is constantly flying from one tree to another. It is one of those which travel in company with many other species.

171. DENDROCOLAPTES SANCTI-THOMÆ, Lafr.

One specimen, from Navarro, April.

172. DENDROCOLAPTES PUNCTICOLLIS, Sclat. and Salv.

Two specimens, ♂ and ♀, from Naranjo, April. I killed the two on the same tree. They were busily engaged in building their nest in a hole of the trunk.

173. DENDROORNIS SUSURRANS, Jard.

One specimen, from San Carlos, February.

174. PICOLAPTES COMPRESSUS, Cab.

Two specimens, from Navarro, May.

175. XIPHORHYNCHUS PUSILLUS, Sclat.

One specimen, from Naranjo, April. This species seems to be rare. My specimen was killed on the trunk of a tree when going up and down on the same.

Family FORMICARIIDÆ.

Subfamily THAMNOPHILINÆ.

176. THAMNOPHILUS NIGRICRISTATUS, Lawr.

Thamnophilus punctatus, Cab.

One specimen, from San Carlos, February. Rare. All the species of this genus go about in the forest in company with many other birds.

177. THAMNOPHILUS NÆVIUS, Gm.

Two specimens, from San Carlos, February.

178. THAMNOPHILUS DOLIATUS, L.

One specimen, from San Mateo, May.

179. DYSITHAMNUS STRIATICEPS, Lawr.

One specimen, from San Carlos, February. A very rare species.

180. DYSITHAMNUS SEMICINEREUS, Sclat.

Several specimens, Naranjo, April.

Subfamily FORMICIVORINÆ.

181. MYRMOTHERULA MELÆNA, Sclat.

Only one specimen of this fine species. It seems to be very rare. I killed it in the forest perched near the ground. It formed part of a large flock of birds which was not a single moment at rest. As I said before, it is a very common occurrence to see large quantities of ants where these birds are. I have always observed that the Tanageridæ (genus *Buarremon*), Turdidæ (several genera) and Dendrocolaptidæ (all the genera) and a few others keep to the ground, feeding on ants and other insects. At the same time birds of other genera, as *Tanagra*, *Calliste*, *Pipra*, and of many genera of Tyrannidæ, Cœrebidæ, and Ampelidæ, are perched on the trees above, some of them feeding on fruit, others on insects. All of them are constantly flying about all the time.

But the most interesting fact is that every species follows the same route. They travel rather fast; and it has always been an object of admiration to me to see how far they could travel in one day, taking their food at the same time.

I was in the habit of searching for one of these flocks. Once found, it was only a matter for me of selecting what species I wanted; but you must follow the same route as they, and occasionally you may lose yourself in the forest. These remarks apply to species found in the tropical forests from the level of the sea to the altitude of 4000 feet. But I have also observed the same thing with the species which inhabit higher altitudes, whether they live in the forests or on the plains.

182. MYRMOTHERULA MENETRIESI, d'Orb.

One specimen, from Naranjo, April.

183. FORMICIVORA BOUCARDI, Sclat.

San Carlos, February.

Rather rare.

184. RAMPHOCÆNUS SEMITORQUATUS, Lawr.

One specimen, from San Carlos, February. Very rare. Perch on small trees in the forest. It was with the flock spoken of above.

185. CERCOMACRA TYRANNINA, Sclat.

San Carlos, February.

186. MYRMECIZA IMMACULATA, Sclat. and Salv.

Several specimens, from San Carlos, February, and San Mateo, May. Rare.

This species is found on both sides of the country—I mean, in the tropical forests of the Atlantic and Pacific plains. It is therefore very probable that tropical species travel from one sea to the other where they have the facility to do so, without the necessity of passing to a higher altitude; and this is the case in Costa Rica. In a certain part of the country you can pass from one sea to the other without leaving the tropical forests.

Subfamily FORMICARIINÆ.

187. PITHYS BICOLOR, Lawr.

One specimen, from San Carlos, February.

188. FORMICARIUS HOFFMANNI, Cab.

One specimen, from San Carlos, February, killed in the forest, on the ground. This bird is constantly going about, and has a peculiar way of raising and lowering its tail when running along, with which I was very much amused. I saw several other specimens always on the ground. The same thing occurs with the birds of the genus *Siurus*.

189. GRALLARIA PERSPICILLATA, Lawr.

One specimen, from San Carlos, February. Very rare.

Family TYRANNIDÆ.

190. SAYORNIS AQUATICA, Sclat. & Salv.

Several specimens, from San José, January, March. This bird has the curious habit of staying all day long on the stones or bushes growing in or near the streams. It will always be seen at the same place for hours and days one after another. It lives on all the insects flying about over the stream. They are always seen in pairs, ♂ and ♀. Another pair may occasionally be seen at a short distance.

Subfamily PLATYRHYNCHINÆ.

191. PLATYRHYNCHUS ALBIGULARIS, Sclat.

One specimen, from Navarro, May.

192. TODIROSTRUM CINEREUM, L.

Several specimens, from Cartago and San José. Rather rare.

193. EUSCARTHMUS SQUAMICRISTATUS, Lafr.

Two specimens, from Naranjo, April. A rare species and difficult to detect. Goes about in the forest on the small trees.

194. SERPOPHAGA CINEREA, Strickl.

From Naranjo, April. Excessively rare and remarkable for its habits. It has exactly the same mode of life as *Sayornis aquatica*, living along the streams and sitting on the stones lying in or near the water.

First I killed the ♀, in the morning, and for hours could not get a shot at the ♂, and went away. In the afternoon I went again to the same place, and after a little while managed to kill the ♂ bird. The two sexes are exactly alike.

My specimens differing from the Columbian bird, which I have under the name of *S. cinerea*, I give a description of them:—

Forehead and cheeks quite black, with the inner webs of the central feathers white, back and upper coverts of the tail ashy grey;

throat, breast, and abdomen of the same colour, but much paler, nearly white on the throat; primaries and secondaries black, tertiaries black with white ends or fringes; upperside of the tail black, under-side dark grey, nearly black; under wing-coverts of the same colour as the abdomen; bill and toes black.

Length 4 inches, wings $2\frac{1}{3}$, tail $1\frac{5}{8}$. The two sexes are exactly alike. Closely allied to *S. cinerea*, but a much smaller bird altogether; besides, the colour of the back has not the olive tint conspicuous in *S. cinerea*.

Subfamily ELAINEINÆ.

195. *MIONECTES OLEAGINUS*, Cab.

One specimen, from San Mateo, May.

196. *TYRANNISCUS PARVUS*, Lawr.

One specimen, from Navarro, May.

197. *ELAINEA PAGANA*, Licht.

Elainea subpagana, Sclat. & Salv.

Several specimens, from San José, January to May. On the edges of the coffee-plantations.

198. *ELAINEA FRANTZII*, Lawr.

One specimen, from the Volcano of Irazu, March.

199. *LEGATUS ALBICOLLIS*, Vieill.

Several specimens, from Naranjo, April, all of them killed on a large tree standing by itself in a "potrero" near the habitations.

200. *MYIOZETETES TEXENSIS*, Giraud.

Two specimens, from San José, March, and Naranjo, April. Common.

201. *RHYNCHOCYCLUS SULPHURESCENS*, Spix.

Only one specimen, from San Carlos, February.

202. *MYIODYNASTES LUTEIVENTRIS*, Sclat.

Two specimens, from Orozi, May.

Subfamily TYRANNINÆ.

203. *MEGARHYNCHUS PITANGUA*, L.

Native name "Chorchita."

One specimen, from San José, March. Not common here.

204. *MUSCIVORA MEXICANA*, Sclat.

Native name "Rey de los Traga moscas."

Two specimens, male and female, from San Ramon. Lives in the forest only. When in love it shows its beautiful crest with much effect.

205. *MYIOBIUS SULPHUREIPYGIUS*, Sclat.

Two specimens, from Naranjo, April.

206. *MYIOBIUS ERYTHRURUS*, Cab.

One specimen, from San Carlos, February.

This seems to be a rare species. I wanted more specimens, and could only succeed in seeing another, which I could not shoot.

207. *MITREPHORUS AURANTIIVENTRIS*, Lawr.

Several specimens, from La Laguna, February Naranjo, April, and Candelaria, May. I killed these in the forest at the altitude of 4000 to 8000 feet. They used to stay at the same place for a long time; they select a branch, and you see them there all day long. All the time they fly about catching insects, and returning to the same spot. I missed one of my specimens twice; notwithstanding, it came back to its favourite branch. There is no appreciable difference between the two sexes. I have also one specimen with the abdomen of the same colour as the throat and the breast; otherwise there is no appreciable difference. It was obtained at San Mateo, altitude 1000 feet.

208. *EMPIDONAX FLAVESCENS*, Lawr.

Several specimens, from Naranjo, April.

209. *CONTOPUS VIRENS*, L.

Several specimens, from Cartago, April.

210. *MYIARCHUS CRINITUS*, L.

Native name "Traga mosca."

Several specimens, from San José, January, and Cartago, April. Rather rare in Costa Rica. They used to perch on a selected branch of the trees edging the coffee-plantations, and remained there all day long catching the insects passing by.

211. *MYIARCHUS PANAMENSIS*, Lawr.

Three specimens, from Punta Arenas, May. Killed on the mangle-trees near the river.

212. *MYIARCHUS LAWRENCEI*, Giraud.

Myiarchus nigricapillus, Cab.

Many specimens, from San José, Cartago, and Naranjo, January to May.

Native name "Tonto vivo."

213. *MYIARCHUS CINERASCENS*, Lawr.

Two specimens, from Punta Arenas, May. Killed at the end of the sandy point near the town.

214. *TYRANNUS MELANCHOLICUS*, Vieill.

Many specimens, from San José, January to May. Common everywhere, especially on the trees surrounding the coffee-plantations.

215. *MILVULUS FORFICATUS*, Gm.

Native name "Tijerillo."

Several specimens from San José, January to May. Very common in the Savana, a beautiful plain about one mile and a half from the town. They are usually perched on the small shrubs in the plain.

Family COTINGIDÆ.

216. *TITYRA PERSONATA*, Jard. & Selby.

Several specimens from Orozi. Always seen perched on the highest trees, where they remain sometimes for hours, as if they were on the watch. They are easily mistaken for *Carpodectes nitidus*, which they resemble very much when seen at a long distance.

217. *PACHYRHAMPHUS VERSICOLOR*, Hartl.

Only one specimen, from Candelaria, May. Very rare.

218. *PACHYRHAMPHUS CINEREIVENTRIS*, Sclat.

One specimen, from San Mateo, May.

219. *LIPAUGUS HOLERYTHRUS*, Sclat. & Salv.

Several specimens from San Carlos, February; and Naranjo, April.

220. *CARPODECTES NITIDUS*, Salv.

One adult female, from San Carlos, February. This sex, being quite new to science, I give a description of it.

Head and back of a dark bluish grey, rather lighter on the forehead; the upper feathers of the tail nearly black, the underside ashy grey; wing-coverts of the same colour as the back; primaries black; the secondaries and tertiaries have a white border on their inner webs; cheeks, throat, and round the eyes white; breast and abdomen pale bluish grey; under wing- and under tail-coverts white; the lower part of the abdomen white; thighs white; toes black; bill blue.

Total length $8\frac{2}{8}$ inches, wing $5\frac{2}{8}$, tail $2\frac{6}{8}$.

I procured this bird quite accidentally. During our stay at San Carlos we used to bathe every afternoon in a stream close by the rancho, and I always carried my gun with me. The third day after our arrival at San Carlos we were quietly enjoying our bath when my friend Meil saw this bird alighting on a tree close by. Immediately he told me I came out of the water and took my gun; but the bird was perched so high that I could not make out with certainty what species it was. I was struck by its colour, and I thought immediately of *Carpodectes*, of which I had seen a figure in the 'Proceedings.' I had a shot at the bird; and it fell down, but far away in the forest amongst Agave plants growing near the stream. My friends saw the direction where it fell; and although I was quite naked, I went into the forest, and, after twenty minutes of the most active search, I had the pleasure of finding it quite dead. Several times I was near giving up the search; but now I feel very happy

that I did not do so, as I consider this bird one of the most valuable additions to my collection.

Every day after that I went to the same place and in the neighbourhood to look for more; but I was disappointed, until the day before my departure, when I saw what I think was the mate of my female; but, to my great annoyance, I could not get a shot at it. It sat for more than two hours, without moving, at the top of a tree more than one hundred feet high, where I could not kill it. It kept me until nightfall with my head lifted up in such a manner that I had a stiff neck when I left. I think it is the greatest punishment for a naturalist to be looking at a very rare bird above his head for several hours without being able to get a shot at it.

When I went away I recommended the people living in the rancho to kill some specimens for me. I offered them a high price; but all for nothing: they said they never saw another. If it was not neglect of theirs, this must be a very rare bird indeed.

221. *CHASMORHYNCHUS TRICARUNCULATUS*, Verr.

One specimen from the Volcano of Irazu, January. This seems to be a rare species. My specimen was killed at the altitude of 6000 feet.

222. *CEPHALOPTERUS GLABRICOLLIS*, Gould.

San Carlos, February; Volcano of Irazu, May. This singular bird is found at all altitudes up to 10,000 feet in the forests. Were it not for its cries it would be excessively difficult to detect, as it always keeps in the densest parts. Its cry is something extraordinary. When I heard it first I thought it was a new species of *Crax* or some other similar large bird. Being very anxious to see what it was, I went into the forest; and after a great deal of trouble I found it. They perch rather high, but are easily killed when once found.

Family *PIPRIDÆ*.

223. *PIPRA MENTALIS*, Sclat.

One specimen from San Carlos, February. Perches usually low, and keeps in the forest.

224. *PIPRA LEUCORRHOA*, Sclat.

Cervantes, Naranjo.

225. *CHIROXIPHIA LINEARIS*, Bp.

Several specimens, from Navarro, May.

226. *CHIROMACHÆRIS CANDÆI*, Parz.

One specimen, from San Carlos, February. Perches on the small trees in the forest; and the male has the particular habit, as have some other species of *Pipridæ*, of making a great sound when flying from one branch to another. It imitates exactly the sound produced by the children's toy rattle. I think this noise is produced by its

beak. It resembles the sound of mandibles opening and shutting with noise several times in succession.

Ordo MACROCHIRES.

Family CAPRIMULGIDÆ.

227. NYCTIDROMUS ALBICOLLIS, Gm.

Two specimens, male and female, from Cartago. They were in a small forest, on the ground. They usually fly away as you get quite close to them, and settle again a little further on.

Family HIRUNDINIDÆ.

228. ATTICORA CYANOLEUCA, Vieill., var. MONTANA, Baird.

Several specimens from San José, March; Cartago, April. During these months they are building their nests in the roofs of the houses. They appear in February, and leave when the rainy season comes.

229. STELGIDOPTERYX FULVIPENNIS, Sclat.

Stelgidopteryx fulvigula, Baird.

Several specimens, from San José, March to May. They are principally seen flying near the streams, sometimes in large quantities. The first time I had a shot at them I killed six; there were about fifty on a small tree. Although I have killed a good many, I never found a female amongst them. I suppose the females must have been in their nests somewhere; but where, I was never able to find out.

Family CYPSELIDÆ.

230. HEMIPROCNE ZONARIS, Shaw (?).

In one of my excursions, at the Volcano of Irazu I saw a large quantity of birds which, I think, must have been this species. I am certain about the genus; but not having been able to get a specimen, I leave the question of species for the future.

Ordo TROCHILI.

231. PHAËTHORNIS LONGIROSTRIS, Delattre.

Naranjo, April. This bird is always seen in the denser part of the forest. One of the favourite flowers on which it feeds is that of the plane-tree.

232. PHAËTHORNIS EMILIÆ, Bourc.

Several specimens from Tres Rios, January; Naranjo, April.

233. PYGMORNIS ADOLPHI, Gould.

San Carlos, February. This is a very common species—but very difficult to detect, as it only comes out of the forest early in the morning and late in the afternoon. In the middle of the day they are very abundant in certain parts of the forest, many specimens being seen at a few yards from one another. They are perched on small dry

branches near the ground. In the pairing-season they sing all day long; the note sounds like "*bebe, bebe*," repeated a great many times in succession. Although it cannot be heard at a long distance, it is perfectly amazing and amusing to hear them. As soon as one finishes, another commences; and it is a puzzle to find where they are, although they may be only at two or three yards distance, on account of their colour and their diminutive size. When singing they move their head and tail in the most pretty way. Now and then they fly about, but soon return to their favourite branch. I have usually heard the song of these birds in the breeding-season, the males singing while the females are on their nests.

When in Mexico I have heard many species of Humming-birds sing, and I could distinguish by its song what species it was. Their songs are very pretty, and quite distinct from one another, especially when they are of birds of distinct genera. I have heard *Pygmornis adolphi*, *Campylopterus hemileucurus*, *Sphenoproctus curvipennis*, *Eugenes fulgens*, *Cœligena clemenciæ*, *Lamprolæma rhami*, *Delattria henrici*, *Petasophora thalassina*, and several other species sing.

234. CAMPYLOPTERUS HEMILEUCURUS, Licht.

Several specimens from Tres Rios, January; and Rancho redondo, May. Rather rare in Costa Rica. Inhabits the forests; but takes its food as well on the flowers of trees growing close by in the open spaces. My specimens were obtained when sucking the flowers of an acacia tree which is found abundantly in the coffee-plantations. It has a special sharp cry when flying about. It commonly constructs its nest in the barrancas, on the plants growing between the rocks, and generally uses moss for its construction.

235. EUGENES SPECTABILIS, Lawr.

One male and one female of this very rare species, from the Volcano of Irazu, April and May. Altitude from 6000 to 8000 feet. It is very fond of a parasitic plant something like mistletoe, which bears a beautiful red flower. No description having been published of the male of this species, I give it now.

Forehead dark metallic blue; back black; rump metallic green; tail bronzy black, with the two central feathers more greenish; wings black, with the upper coverts metallic green; throat metallic dark green; breast and abdomen greyish, mixed with green feathers; feet and beak black.

Length $5\frac{5}{8}$ inches, wing $3\frac{2}{8}$, tail $1\frac{6}{8}$, beak $1\frac{1}{8}$. (Mus. Boucard.)

The chief distinctions between this species and *Eugenes fulgens* are in its much larger size, its longer beak, its grey breast and abdomen, its back entirely black, and the colour of the crown and throat, which are quite of a different green and blue.

236. OREOPYRA CINEREICAUDA, Lawr.

One specimen of this rare species, from Navarro, May. Inhabits the forest.

237. *OREOPYRA CALOLEMA*, Salv.

Many specimens of both sexes from Naranjo, April; Navarro and Rancho redondo, May. I have not the least doubt that the bird described as *Anthocephala castaneiventris*, Gould, is the female of this species. These birds are only met with in the forest.

238. *OREOPYRA HEMILEUCA*, Salv.

Two specimens, from Naranjo, April. It seems to be a very rare species.

239. *PETASOPHORA CYANOTIS*, Bourc.

Petasophora cabanisi, Lawr.

Several specimens from the Volcano of Irazu, April. Rather common at the altitude of 8000 feet, feeding on the flowers of a small shrub. They take possession of a certain space containing several of these shrubs; and when not feeding on these flowers, they perch on a dry branch near the place, and fight all the other Humming-birds that dare to intrude.

240. *HELIODOXA JACULA*, Gould.

Heliodoxa henryi, Lawr.

Several specimens from Naranjo, April; Volcano of Irazu, May. One male, although it is not in very fine plumage, has a bright front, and the throat exactly like the specimens from Columbia. Rather rare in Costa Rica.

241. *HELIOMASTER CONSTANTI*, Delattre.

Only one young male, from San José, January; killed while he was sucking the flower of an acacia tree.

242. *THALURANIA COLOMBICA*, Bourc. & Muls., var. *VENUSTA*, Gould.

Several specimens from San Carlos, February; and Naranjo, April. It perches on very high trees in the forests, and is difficult to get at. It is a rare species in Costa Rica.

I spent many hours before I could get the pair which I have, from San Carlos. I could not recognize the bird, because it was standing and feeding on the flowers of a parasitic plant very high on a large cedar tree. I thought it was a new species of *Microchera*, so small was its appearance. When I killed the first I was quite disappointed, and was sorry to have lost so much time for it.

243. *KLAIS GUIMETI*, Bourc. & Muls.

Klais merriti, Lawr.

Only two specimens, from Navarro, May: a very rare species.

244. *MICROCHERA PARVIROSTRIS*, Lawr.

Only one specimen of a young male, given to me by Mr. Juan Zeledon. Excessively rare. Although I knew the exact locality where found, I could never find one.

245. PAPHIOSA HELENÆ, Del.

I saw several male specimens of this species at San Carlos; but I was never able to get a shot at them. I have one female specimen from Turrialba.

246. DORYCHA BRYANTÆ, Lawr.

San José, March; Volcano of Irazu, April. A very rare species. It appears as soon as it is daylight, and is very quick. It never rests long in one place. When on the wing it makes a great noise, similar to that of a large Coleopteron (Scarabeidæ) when flying.

247. TROCHILUS COLUBRIS, Linn.

One specimen, from San José, January. Seems to be very rare in Costa Rica.

248. SELASPHORUS SCINTILLA, Gould.

Several specimens from Cartago, April; and Volcano of Irazu, May. Seen also at the high altitude of 10,000 feet in company with *Selasphorus flammula*. Feeds on the flowers of small plants. When I say feeds on the flowers, I mean that it takes from the flowers not only the honey, but, above all, the minute insects which are inside. This is usual with all the Humming-birds. I have no doubt that they can live a certain time on honey only; but it is not sufficient, and their principal food is insects. It is very seldom that you skin a Humming-bird without finding the crop filled partially with insects of all descriptions. I have brought home a certain number of crops in alcohol. All of them contain insects, which I intend to determine as soon as possible. *S. scintilla* makes a very slight noise when flying; it is not more than that of a drone-bee.

The place where I killed my specimens had been taken possession of by a certain number of *Sancerottia sophiæ* and *Pyrrhophæna riefferi*. Each one of these had its assigned place, and used to drive away any trespasser. I noticed that *S. scintilla* used to go only to the small plants near the ground; and I have no doubt that the little noise made by the bird was to escape its enemies *S. sophiæ* and *P. riefferi*. Flying very low was another precaution; however, the sight and the hearing of these little birds is so subtle that poor *S. scintilla* was soon detected and obliged to fly away. I think this also is the reason why this species was rather scarce.

249. SELASPHORUS FLAMMULA, Salv.

Several specimens, male and female, of this very rare species. All of them were killed at the summit of the Volcano of Irazu, on parasitic plants (mistletoe) growing on small alpine trees in a soil composed principally of ashes and scorïæ. There, at the altitude of 10,000 feet and more, it takes possession of a locality where flowers are abundant, and defends its property against *S. scintilla* and other birds.

250. *THAUMATIAS CUPREICEPS*, Lawr.

One specimen, from Naranjo, April, killed in the forest. I have also several other specimens of this species sufficiently good for skeletons.

251. *EUPHERUSA EGREGIA*, Sclat. & Salv.

One specimen, from Navarro, May.

252. *AMAZILIA CINNAMOMEA*, Less.

Several specimens, from San Mateo and Puntarenas, May. This species seems to be found only on the Pacific coast. I have some specimens from Tehuantepec; and I remember having seen this species near Juquila (Mexico). The male and female are exactly alike. They are fond of the flowers of orange-trees.

253. *PYRRHOPHÆNA RIEFFERI*, Bourc.

Several specimens, from San José and Cartago, January to May. Very common species, and quite domestic in its habits. Quantities of them may be seen in private gardens.

254. *SAUCEROTTIA SOPHIÆ*, Bourc.

Several specimens, from San José and Cartago, January to May. They are constantly fighting with *P. riefferi*; but this species is seldom seen in the gardens of San José.

255. *PANTERPE INSIGNIS*, Cab. & Heine.

Several specimens of this fine species, from the Volcano of Irazu, April and May. I never saw this bird anywhere else. It is very rare. It feeds on the mistletoe growing on the robble (oak tree).

The female is a little smaller than the male; but otherwise they are exactly alike. This is one of the few species in which the female is a bright-coloured bird, nearly as fine as the male. I have several females, and I am quite sure about the sex.

256. *DAMOPHILA AMABILIS*, Gould.

Several specimens, from San Carlos, February. A very rare species; found only in the forest.

257. *SAPPHIRONIA BOUCARDI*.

Arinia boucardi, Muls., Ann. Soc. Linn. de Lyon, 12 Oct. 1877.

Several specimens, from Puntarenas, May. Male and female. Mus. Boucard.

258. *CHLOROLAMPIS CANIVETI*, Less.

Chlorolampis salvini, Cab.

Several specimens, from San José and Cartago, January to May. Commonly found in the gardens, where it makes its nest.